

**REGULATORY EVALUATION OF THE REQUEST
FOR RENEWAL OF THE FEDERAL GRANT OF RIGHT-OF-WAY
FOR THE TRANS-ALASKA PIPELINE SYSTEM
(TAPAA Report)**

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NOTATION

The following is a list of acronyms, initialisms, and abbreviations used in this document.

AAI	audit action item
ADNR	Alaska Department of Natural Resources
ANS	Alaska North Slope
ANWR	Arctic National Wildlife Refuge
APSC	Alyeska Pipeline Service Company
ARCO	Atlantic Richfield Company
BLM	Bureau of Land Management
BP	British Petroleum Company
BWTF	Ballast Water Treatment Facility
CFR	<i>Code of Federal Regulations</i>
CMP	Comprehensive Monitoring Program
DEIS	draft environmental impact statement
DNV	Det Norske Veritas
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DRA	drag reducing agent
EIS	environmental impact statement
FEIS	final environmental impact statement
FTC	Federal Trade Commission
FWS	U.S. Fish and Wildlife Service
JPO	Joint Pipeline Office
LVB	line volume balance
MLA	Minerals Leasing Act of 1920, as amended
MP	milepost
NEPA	National Environmental Policy Act of 1969, as amended
NEPDG	National Energy Policy Development Group
NMFS	National Marine Fisheries Service
NOPV	Notice of Probable Violation
NPR-A	National Petroleum Reserve-Alaska
O&M	operations and maintenance
OCC	Operations Control Center
OPS	Office of Pipeline Safety
P.L.	Public Law
PS	pump station
RCM	reliability centered maintenance
RMP	resource management plan
ROD	Record of Decision
ROW	right-of-way
SCADA	supervisory control and data acquisition
SERVS	Ship Escort Response Vessel System
SHPO	State Historic Preservation Officer
TAPAA	Trans-Alaska Pipeline Authorization Act of 1973, as amended
TAPS	Trans-Alaska Pipeline System

TVB	transient volume balance
USACE	U.S. Army Corps of Engineers
USC	<i>U.S. Code</i>
USGS	U.S. Geological Survey
VSM	vertical support member

1 PURPOSE

The current Trans-Alaska Pipeline System (TAPS) Owners applied for renewal of the Federal Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline System (Federal Grant) and related facilities on May 2, 2001. The requirements for renewal of the Federal Grant are given in regulations issued under Section 28 of the Minerals Leasing Act of 1920, as amended (MLA; 30 *U.S. Code* [USC] § 185). This report presents the results of an evaluation of the renewal application conducted by the Bureau of Land Management (BLM) of the U.S. Department of the Interior (DOI).

The BLM has completed an environmental impact statement (EIS) process pursuant to the requirements of the National Environmental Policy Act of 1969, as amended (NEPA). This EIS was prepared to assess the environmental, social, economic, and physical impacts of renewing or not renewing the Federal Grant. The draft EIS (DEIS) included a copy of the current Federal Grant. A key component of the EIS process is a public review and comment period. A Record of Decision (ROD) is currently being prepared now that the EIS has been completed to document the final decision to renew the Federal Grant. As part of the EIS process, the BLM conducted government-to-government consultations with 21 substantially and directly affected Alaska Native Tribes. Other required consultations included discussions with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) on threatened and endangered species, and the Alaska State Historic Preservation Officer (SHPO) on cultural resources.

This summary-level report is informational and supplements (does not supplant) the overall renewal effort by focusing on specific federal legal and regulatory requirements for renewal of the Federal Grant and the current status of TAPS in regard to those requirements. Much of the information in support of the statements and conclusions is presented in other documents, including the DEIS and the references cited therein; Comprehensive Monitoring Program (CMP) reports, annual reports, and other documents prepared by the Joint Pipeline Office (JPO); and information developed and provided to JPO by the TAPS Owners to support their renewal application. Readers seeking more detailed information on TAPS should refer to those sources. This report is limited to those considerations associated with BLM responsibilities for evaluating the request for renewal of the Federal Grant.

The State of Alaska has completed a parallel process for renewal of the State Lease of Right-of-Way (ROW) for TAPS and has closely cooperated with BLM on the renewal process for the Federal Grant. The State Lease renewal process also included public input and review opportunities.

2 REGULATORY REQUIREMENTS FOR RENEWAL OF THE FEDERAL GRANT

The BLM received an application on May 2, 2001, from the current TAPS Owners for renewal of the Federal Grant. (While TAPS is authorized under a number of separate rights-of-way, common usage is to refer to these as a single right-of-way.) The TAPS Owners have requested an extension of the Federal Grant for an additional 30 years. BLM must address a number of considerations in reviewing this application, as specified in regulations issued under Section 28 of The Mineral Leasing Act (MLA). This section identifies and summarizes these requirements, which are addressed in subsequent sections of this report.

The Trans-Alaska Pipeline Authorization Act (TAPAA; 43 USC §§ 1651-1656) is Title II of Public Law [P.L.] 93-153, which was signed by President Nixon on November 16, 1973. It directed the Secretary of the Interior to authorize ROWs through federal lands for the construction and operation of TAPS. The Secretary of the Interior issued the Federal Grant for the pipeline on January 23, 1974. The technical and environmental stipulations governing the construction and operation of TAPS are identified in the Federal Grant.

P.L. 93-153 consisted of four parts (titles). Title I amended Section 28 of MLA by adding subsections (a) through (y). Title II (TAPAA) authorized construction and operation of TAPS. Title III directed the President to enter into negotiations with the Government of Canada to determine the feasibility of constructing overland pipelines through Canada for the transport of oil and natural gas from the North Slope of Alaska to the Lower 48 States. Title IV addressed a number of miscellaneous topics. Section 203(c) of TAPAA states

(c) Rights-of-way, permits, leases, and other authorizations issued pursuant to this title by the Secretary shall be subject to the provisions of section 28 of the Mineral Leasing Act of 1920, as amended by title I of this Act...

The requirements for issuance and renewal of the Federal Grant are the same as those for any other oil pipeline traversing federal land as given in Section 28 of MLA. While TAPAA contains a number of considerations for construction and operation of TAPS, there are no additional requirements directly applicable to the renewal of the Federal Grant.

Those portions of Section 28 of MLA relevant for renewal of the Federal Grant (as given in 30 USC §185) are identified as follows.

Grant of Authority

(a) Rights-of-way through any Federal lands may be granted by the Secretary of the Interior or appropriate agency head for pipeline purposes for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom to any applicant possessing the qualifications provided in section 1 of this Act [30 USCS §181], as amended, in accordance with the provisions of this section.

Inter-Agency Coordination

(c) (1) Where the surface of all of the Federal lands involved in a proposed right-of-way or permit is under the jurisdiction of one Federal agency, the agency

head, rather than the Secretary, is authorized to grant or renew the right-of-way or permit for the purposes set forth in this section.

(2) Where the surface of the Federal Lands involved is administered by the Secretary or by two or more Federal agencies, the Secretary is authorized, after consultation with the agencies involved, to grant or renew rights-of-way or permits through the Federal lands involved. The Secretary may enter into interagency agreements with all other Federal agencies having jurisdiction over Federal lands for the purpose of avoiding duplication, assigning responsibility, expediting review of rights-of-way or permit applications, issuing joint regulations, and assuring a decision based upon a comprehensive review of all factors involved in any right-of-way or permit application. Each agency head shall administer and enforce the provisions of this section, appropriate regulations, and the terms and conditions of rights-of-way or permits insofar as they involved Federal lands under the agency head's jurisdiction.

Regulatory Authority

(f) Rights-of-way or permits granted or renewed pursuant to this section shall be subject to regulations promulgated in accord with the provisions of this section and shall be subject to such terms and conditions as the Secretary or agency head may prescribe regarding extent, duration, survey, location, construction, operation, maintenance, use, and termination.

Technical and Financial Capability

(j) The Secretary or agency head shall grant or renew a right-of-way or permit under this section only when he is satisfied that the applicant has the technical and financial capability to construct, operate, maintain, and terminate the project for which the right-of-way or permit is requested in accordance with the requirements of this section.

Duration of Grant

(n) Each right-of-way or permit granted or renewed pursuant to this section shall be limited to a reasonable term in light of all circumstances concerning the project, but in no event more than thirty years. In determining the duration of a right-of-way the Secretary or agency head shall, among other things, take into consideration the cost of the facility, its useful life, and any public purpose it serves. The Secretary or agency head shall renew any right-of-way, in accordance with the provisions of this section, so long as the project is in commercial operation and is operated and maintained in accordance with all of the provisions of this section.

Common Carriers

(r) (1) Pipelines and related facilities authorized under this section shall be constructed, operated, and maintained as common carriers.

Antitrust Laws

(y) The grant of a right-of-way or permit pursuant to this section shall grant no immunity from the operation of the Federal antitrust laws.

The requirements for ROWs for oil pipelines crossing federal lands issued under Section 28 of MLA are codified in Title 43 of the *Code of Federal Regulations* (CFR) in Part 2880 (43 CFR Part 2880). Requirements applicable for renewal of the Federal Grant are given in 43 CFR 2881.1-1(e) and (f), and 2883.1-5(c) as follows.

(e) A right-of-way grant issued or renewed under these regulations shall be limited to a reasonable term, not to exceed 30 years. No term shall be longer than is necessary to accomplish the purpose of the grant. The authorized officer shall determine the duration of each right-of-way grant, taking into consideration, among other things: (1) The cost of the facility, (2) Its useful life, (3) Any public purpose it serves, and (4) Potentially conflicting uses of the land.

(f) Except where a right-of-way grant has terminated by its terms upon the occurrence of a fixed or agreed upon condition, event, or time, it shall be renewed if the pipeline is being operated and maintained in accordance with all provisions of the right-of-way grant, these regulations and the Act. The authorized officer may modify the terms and conditions of the right-of-way grant at the time of renewal.

(c) The authorized officer shall require, prior to issuing or renewing a right-of-way grant, that the applicant submit and disclose all plans, contracts, agreements, or other information or material which the authorized officer considers necessary to determine whether a right-of-way grant shall be issued or renewed and the terms and conditions which should be included in the grant. Such information may include, but is not limited to: (1) Conditions for, and agreements among, owners or operators regarding the addition of pumping facilities, looping, or otherwise increasing the pipeline or terminal's throughput capacity in response to actual or anticipated increases in demand; (2) Conditions for adding or abandoning intake, offtake, or storage points or facilities; and (3) Minimum shipment or purchase tenders.

In summary, the Federal Grant may be renewed for a reasonable period, not to exceed 30 years nor for a period longer than is necessary to accomplish the purpose of the Grant. For renewal, the TAPS needs to be in commercial operation and operated in compliance with the Federal Grant requirements and stipulations. The BLM must be satisfied that the applicant has the technical and financial capability to operate, maintain, and terminate the project in an appropriate manner consistent with all applicable requirements. The TAPS must be operated as a common carrier in accordance with federal antitrust laws, and the applicant should provide BLM all plans, contracts, and agreements for future use of the pipeline. In determining the duration of the renewed Federal Grant, the BLM shall take into consideration the cost of the facility, its useful life, any public purpose it serves, and potentially conflicting uses of the land. These issues are addressed in Section 4 of this document.

3 DESCRIPTION OF TAPS AND JPO OVERSIGHT ACTIVITIES

3.1 HISTORY

Shortly after oil was discovered at Prudhoe Bay in 1968, three firms active in North Slope oil exploration — Atlantic Richfield Company (ARCO), Humble Oil and Refining Company (now Exxon Corporation), and British Petroleum Company (BP) — formed an organization called the Trans-Alaska Pipeline System to transport North Slope crude oil to market. In 1969, five more companies joined the consortium — Union Oil of California, Phillips Petroleum Company, Amerada Hess Corporation, Mobil Oil Corporation, and Home Oil Company of Canada (which later dropped out). These owner companies established the Alyeska Pipeline Service Company (APSC) in 1970 to build and operate TAPS. In 1971, Standard Oil Company of Ohio (Sohio) came into the project by trading 25% of its stock for some of BP's North Slope oil leases.

Construction activities on TAPS did not begin until 1974. The delay was caused by disputes over Alaska Native land claims, compliance requirements for NEPA, and legal actions brought by several environmental organizations. Issues associated with Alaska Native land claims were generally resolved with the adoption of the Alaska Native Claims Settlement Act of 1971. An EIS process was completed in 1972 for compliance with NEPA, and outstanding legal issues associated with environmental concerns (including the adequacy of the EIS) were circumvented by passage of TAPAA. President Nixon signed P.L. 93-153 on November 16, 1973, after a vote cast by Vice President Agnew broke a 49-to-49 deadlock in the Senate. The closeness of this vote was not a result of questions on the need to transport North Slope crude oil to the Lower 48 States, but rather a result of issues associated with the appropriate route for the pipeline and the adequacy of environmental analyses supporting TAPS.

Throughout the delays of the early 1970s, the APSC continued to work on the design and specifications of the pipeline in coordination with federal and state regulatory and oversight agencies. Fieldwork began in 1974, and TAPS was completed in 1977. This massive construction project utilized a workforce of 70,000 people and cost \$8 billion. The TAPS consists of an 800-mile, 48-inch-diameter crude oil pipeline, the Valdez Marine Terminal, 11 pump stations and support facilities. To support construction of the pipeline, a permanent haul road was constructed from the Yukon River to Prudhoe Bay in 1974. Ownership and control of this road were transferred to the State of Alaska in 1978, and it was named the James B. Dalton Highway in 1981.

The U.S. Department of Transportation (DOT) certified the pipeline on June 16, 1977, and the Authorized Officer gave APSC permission to operate TAPS on June 19. Although APSC moved oil slowly through the pipeline, several problems occurred during startup. The most significant problem was an explosion and fire at Pump Station (PS) 8 that destroyed the building, killed a worker, and resulted in the release of about 300 barrels of oil. These startup incidents temporarily halted the oil's progress southward, but the system proved functional, and oil reached the Valdez Marine Terminal on July 29.

The TAPS operations have resulted in spills and releases of oil since June 1977. Many of the reported spills (particularly smaller spills) occurred inside buildings, within secondary containment structures, or onto gravel pads and were contained. Other spills occurred in winter when the ground was frozen and were cleaned up before the spring breakup. The most

significant release of oil that was transported through TAPS occurred on March 24, 1989, when the Exxon Valdez tanker went aground on Bligh Reef in Prince William Sound. This accident resulted in the release of about 257,000 barrels of oil to Prince William Sound and required a massive cleanup effort. The Exxon Corporation spent \$2.2 billion on cleanup activities, paid more than \$300 million to more than 11,000 impacted people and businesses, and settled natural resource damage and other claims with the federal government and State of Alaska for approximately \$1 billion (TAPS Owners 2001a). To ensure that such an accident of this magnitude would not happen again, the APSC established the Ship Escort Response Vessel System (SERVS) for the safe transit of oil tankers from the Valdez Marine Terminal through Prince William Sound to Hinchinbrook Entrance and the Gulf of Alaska.

The second largest release of oil to the environment occurred at Steele Creek near Fairbanks on February 15, 1978. This release was the result of a sabotage event in which an aboveground section of pipe was intentionally breached, resulting in the release of about 16,000 barrels of oil. The flow of oil was stopped, and the pipeline was repaired. Another sabotage event occurred on October 4, 2001, when a bullet pierced the pipeline near PS 7, resulting in the release of about 6,800 barrels of oil. The pipeline was repaired by October 7, and oil flow through the pipeline was reinitiated.

The TAPS facilities are routinely maintained and upgraded to ensure safe and efficient operation and to minimize the likelihood of releases. In addition to visual inspections, use is made of "pigs," which are launched into the pipeline at PS 1 and 4 and carried along with the flow of oil. Pigs can be recovered at PS 4 and the Valdez Marine Terminal. The pigs can be used to clean accumulated wax from interior pipe walls, to survey interior pipe diameter, to detect corrosion on the inside or outside walls of the pipe, and to measure pipe movement. If necessary, repairs can be made to the pipeline to correct problems. The largest repair to date was the replacement of 8.5 miles of corroded pipeline at Atigun Pass in 1991. More than 150 sleeves have been welded on the pipeline for dents and buckles (such as caused by settlement) and corroded pipe (APSC 2002).

The Joint Pipeline Office performs routine monitoring and surveillance to ensure that TAPS facilities are being operated and maintained in accordance with Alyeska Pipeline Service Company (APSC) procedures and the requirements and stipulations specified in the Federal Grant and State Lease. State and federal oversight agencies review TAPS design changes and inspect facilities. Any observations or concerns are communicated to APSC for repair or correction. More detailed information on these oversight activities is presented in the following sections of this report.

3.2 DESCRIPTION OF TAPS

As stated previously, the TAPS consists of an 800-mile, 48-inch-diameter crude oil pipeline, the Valdez Marine Terminal, 11 pump stations, and support facilities. The pipeline is elevated aboveground for 420 miles and buried for the other 380 miles. The 11 pump stations were built to move oil through the pipeline, and 4 of these are now on standby. The Valdez Marine Terminal on Prince William Sound has storage facilities for 9.18 million barrels of oil and loading berths. Except for occasional brief shutdowns for maintenance and repair, the pipeline has operated continuously since its startup in June 1977. The TAPS has transported more than 13 billion barrels of crude oil. The peak average daily throughput of 2.03 million barrels per day

was reached in 1988; however, that rate dropped to approximately 1 million barrels per day by the end of 2001. The total travel time through the pipeline at the current flow rate is about 9 days. The TAPS facilities occupy about 16.3 square miles of Alaska.

The TAPS transports all oil produced from more than a dozen North Slope oil fields located primarily on state mineral leases. The North Slope crude oil is delivered to TAPS by several feeder pipelines. Although most of the oil is transported to the Valdez Marine Terminal, a small portion is diverted to three commercial oil refineries, two at North Pole near Fairbanks and one at Valdez. Most of the petroleum products from these three refineries are used within the State of Alaska. The connections to these refineries consist of offtake and return lines, isolation valves, and metering stations. The feeder pipelines and refinery delivery lines are not part of the TAPS right-of-way.

The pipeline is epoxy-coated and taped for corrosion protection. It begins about 6 miles from the Arctic Coast of Alaska and ends at the Valdez Marine Terminal on Port Valdez. The pipeline crosses more than 800 rivers and streams and three mountain ranges. At most small streams, the pipeline bridges the water channel on conventional aboveground supports. At 13 locations, however, special bridges were built: 1 highway bridge, 9 standard plate-girder bridges, 2 special suspension bridges, and 1 tiered-arch bridge. At certain locations where the pipeline crosses or parallels rivers, engineering structures (typically gravel embankments and riprap) were built to deflect the river's flow and protect the pipeline from erosion of the riverbank, riverbed, or floodplain.

The temperature of crude oil leaving PS 1 is 115°F. At a flow rate of 1 million barrels per day, the oil is about 60°F when it arrives at the Valdez Marine Terminal. One-half of the pipeline corridor traverses ice-rich soil that becomes unstable if thawed. To avoid exposing these soils to the warm pipe, more than one-half of the pipeline is above ground. The pipeline is buried in stable soils where thawing would not cause the pipe to settle. About four miles of pipe are buried in thaw-unstable soils for big game passage and a highway crossing. These sections are mechanically refrigerated to maintain soil stability. Two sections of pipe in Atigun Pass are buried in insulated boxes to keep the permafrost frozen and to protect the pipeline from avalanches.

The 420 miles of aboveground pipeline are supported by approximately 78,000 vertical support members (VSMs) located every 60 feet. Anchor structures are spaced every 800 to 1,800 feet and hold the aboveground pipe in position. Between anchors, the pipe can move up to 170 inches side to side (laterally) for thermal expansion and seismic movement. The pipeline crosses five seismic zones and is designed and constructed to withstand the most severe earthquake that could reasonably be expected within each zone. Most pump stations and the Valdez Marine Terminal are equipped with accelerometers that detect, measure, and record earthquake-induced ground motion and that compile and process the data used to estimate the distribution of ground-shaking effects along the pipeline route; alarms are sounded as appropriate. The pipeline will be automatically shut down should significant ground motion occur which could impact the safe operation of TAPS. (The Trans-Alaska Pipeline recently withstood a 7.9 magnitude earthquake November 3, 2002 along the Denali Fault in interior Alaska. The pipeline had minimal damage and the damage that did occur was to some vertical support members. No oil was leaked or spilled).

Valves are strategically placed along the pipeline to isolate sections of the pipeline and to minimize the size of potential spills in the event of a pipe rupture. The TAPS has 177 pipeline valves: 95 are gate valves (86 remotely controlled, 9 manually operated), 1 is a remote-controlled ball valve, and 81 are check valves that automatically prevent backflow when the pipeline shuts down. All valves can be operated manually for maintenance of the line and for spill isolation, if necessary. Valve locations are based on environmental and resource considerations, as well as on construction and operating requirements. The valves are spaced to limit the amount of a spill at any point to a maximum of 54,000 barrels from static draindown. Check valves would limit backflow drainage in the event of a leak or break. Remotely operated valves are placed at major river crossings and other locations where quick closure would be necessary in an emergency. Batteries power remote-controlled valves. Propane-fired systems serve as battery chargers when commercial power is not available.

A gravel workpad ranging from 18 to 48 inches thick was used for construction of TAPS and was designed to protect the underlying soils and provide a safe working surface for construction. The workpad occupies only a portion of the TAPS ROW. Currently, the workpad provides access and a work platform for surveillance and maintenance activities and includes a 15-foot-wide drive lane along most of the pipeline.

The 11 pump stations (PS) are located at intervals of 50 to 100 miles to boost crude oil pressure and provide relief storage for emergency shutdown. PS 5 does not have mainline pumps and serves to relieve pressure on the downslope side of Atigun Pass. The TAPS was originally designed for 12 pump stations, but PS 11 was not built because the development and use of drag reducing agent (DRA) allowed the number of pump stations to be reduced by one. The DRA is a long-chain hydrocarbon polymer injected into the oil stream to reduce the energy lost during transit because of turbulence. The DRA-injection facilities are located at PS 1, 7, and 9 and at Milepost (MP) 238.

The pump stations are similar in layout and function, although certain differences occur because of location and station tasks. The stations are housed within structures for protection against the environment and include pumps and turbine drivers (except PS 5), isolation valves, relief tanks with secondary containment, fuel-handling facilities, station and pipeline control facilities, living quarters (except for PS 1, 7, and 9), office buildings, shops and warehouses, and other facilities required for operations and maintenance (O&M) activities for the pipeline. The pump stations are fenced, and continuous security is provided at each station. PS 1 has a vapor-recovery system for the crude oil storage tanks. PS 1, 3, 4, 5, 7, 9, and 12 are currently operating; PS 2, 6, 8, and 10 were placed on standby in 1996 and 1997 because of declining throughput and use of DRA. PS 7 and 12 may also be placed on standby status over the next 5 to 10 years.

The turbines at PS 1 through 4, north of the Brooks Range are powered by natural gas that is carried from the North Slope through a gas pipeline that generally runs parallel to the oil pipeline. The first 34 miles of pipeline from PS 1 south consists of 10-inch-diameter pipe, and the remainder of pipeline is 8-inch-diameter pipe. Turbines at the other pump stations are powered with liquid turbine fuel purchased from commercial suppliers who deliver the fuel in tanker trucks. (Crude oil topping units located at PS 6, 8, and 10 previously produced liquid turbine fuel for the pump stations south of the Brooks Range. The topping units at PS 8 and 10 were placed on standby in 1996, and the topping unit at PS 6 was placed on standby in June

1997.) If the natural gas supply is interrupted, the turbines at PS 1 through 4 can be converted to operate on liquid turbine fuel.

In normal operating mode, most pump station functions are controlled from the Operations Control Center (OCC). If required, the pipeline controller at the OCC can adjust pressure controls to increase or decrease the throughput. Pressure relief systems at the pump stations are designed to keep the pressure from surges and other deviations from normal operations from exceeding 110% of the mainline pipe maximum allowable operating pressure at any point along the pipeline. Main pumps at the stations can be shut down locally or from the OCC. The speed of the turbines that drive the main pumps can be changed, and pressure controllers automatically vary pump speeds to keep line pressure within preset limits. Under emergency conditions, the control room at the OCC or pump stations can shut down the station and close remote gate valves. All critical station equipment is fully automatic with local manual override capability.

The Valdez Marine Terminal is the terminus of TAPS, and is located on ice-free Port Valdez at the northeastern end of Prince William Sound. The Valdez Marine Terminal site covers approximately 1,000 acres on the southern shore of Port Valdez. At the Valdez Marine Terminal, oil is loaded onto tankers for shipment to markets. Most of the oil is shipped to the West Coast of the United States for refining and distribution. The Valdez Marine Terminal has storage facilities for 9.18 million barrels of crude oil and four loading berths. Berths 4 and 5 have vapor-control systems and will be the primary loading berths in the future. Berths 1 and 3 do not have vapor-control systems but can be used in special situations. Berth 2 was never built.

Crude oil arriving at the Valdez Marine Terminal is measured at the East Metering Building and then either goes to storage tanks or is directly loaded onto tankers. Ballast water from incoming tankers is piped to the Ballast Water Treatment Facility (BWTF) for treatment before discharge to Port Valdez in accordance with existing permits. Vapor from tankers is managed by the vapor-control system and vapor from the crude oil storage tanks is managed by the vapor-recovery system. The current fleet serving the Valdez Marine Terminal consists of 26 tankers, 3 three with double hulls and 13 with double sides. The composition of this fleet must change to stay in compliance with the Oil Pollution Act of 1990, which requires all tankers calling at ports of the United States to have double hulls by 2015. According to current projections, the last of the single-hulled tankers operating in Prince William Sound will be phased out by the end of 2013. The fleet serving Valdez Marine Terminal will consist exclusively of double-hulled tankers beginning in 2014 (TAPS Owners 2001b).

Microwave, satellite, and radio technologies are used for remote monitoring and control of pipeline operations. The TAPS voice communication system consists of a private telephone network and a mobile radio system. Two party-line channels on the microwave system are allocated for voice communications between all pump stations and the Valdez Marine Terminal. The mobile radio system consists of a very high frequency radio base and microwave repeater stations located at strategic sites, microwave control channels, and interconnecting links to the telephone network throughout the system. The existing analog microwave system is being upgraded to a more modern and technically superior digital microwave system for critical control-system communications. A fiber-optic communications system has been installed along the TAPS ROW, and this network is used for noncritical voice and data communications.

The OCC continually monitors the status of all pump stations and valves by using supervisory control and data acquisition (SCADA) systems with remote sensors. Data such as pressures, flow rates, temperatures, tank levels, and valve positions are recorded and analyzed for abnormal operations or any indication of a pipeline leak. The pipeline controller at the OCC can rectify any abnormal operation by changing settings for pump speed or relief valves or by issuing idle or stop commands to the mainline pumps. The OCC controller can also activate remote control valves. The monitoring and analysis systems include backup communications equipment and computers.

Two leak detection systems are used on TAPS. The line volume balance (LVB) system monitors the amount of oil entering and leaving the pipeline, tank levels, and line packing. This system is very sensitive, although its reaction time may be long for small leaks and it is not able to identify the location of a leak along the pipeline. The LVB system addresses the pipeline, pump stations, and the Valdez Marine Terminal. The transient volume balance (TVB) system calculates pipeline segment imbalances by comparing measured flows to a hydraulic model of the pipeline. This system is limited to the pipeline proper, but it has a much faster response time than the LVB system and can identify the location of the leak along the pipeline. In addition, alarms will signal deviations in pressure, flow, or flow rate balance. If emergency conditions occur, the pipeline controller can either shut down an entire pump station and isolate it from the line or shut down the entire pipeline. Pressure relief systems are in place to prevent overpressure during each type of shutdown.

3.3 OVERSIGHT OF TAPS

The JPO is a consortium of six federal and seven State of Alaska agencies responsible for regulation and oversight of TAPS and other common-carrier oil and gas pipelines in Alaska. A listing of the federal and state agencies that comprise JPO and their respective responsibilities is shown in Table 1. JPO was formed in 1990 as a result of a cooperative effort between the BLM and the Alaska Department of Natural Resources (ADNR), the two land-management government agencies that administer rights-of-way for oil and gas pipelines in Alaska. The integrated agency approach is meant to provide better service to the public and industry by eliminating duplication of work, coordinating activities, improving communication among agencies, industry, and the public; sharing expenses, and streamlining the permitting process.

An Agreement to Support the State-Federal Joint Pipeline Office was signed in early 1994 by the 11 agencies that composed JPO at that time (JPO 1994). An updated agreement was signed in 1997 by the same 11 agencies (JPO 1997). The purpose of these agreements was to establish a formal and effective partnership to provide coordinated state and federal permitting, monitoring, enforcement, and preparedness planning activities for TAPS and other common-carrier oil and gas pipelines in Alaska. The agreements encouraged and provided for an improved intergovernmental relationship in regulating and overseeing pipelines within each agency's laws and regulations.

The JPO is jointly managed by the Authorized Officer for BLM and the State Pipeline Coordinator for ADNR. Nine of the 13 agencies have co-located agency liaisons within JPO. The individual agencies that make up JPO receive their regulatory authority through federal and state laws and regulations. Each JPO agency retains its individual authority within this structure to accomplish oversight and regulatory goals. The JPO conducts engineering and technical

evaluations of proposed projects for TAPS to ensure safe operations and compliance with appropriate engineering codes and criteria. The agencies that make up JPO have a variety of responsibilities, including issuing all necessary permits and authorizations to operate TAPS and monitoring to identify deficiencies and compel corrective actions.

The JPO uses the Comprehensive Monitoring Program (CMP) for oversight of TAPS. The basic purpose of the CMP is to systematically verify compliance with the Federal Grant and State Lease. The CMP process

TABLE 1 Federal and State Agencies within the Joint Pipeline Office

Federal Agency	State Agency
<p><i>DOI/Bureau of Land Management</i> Issues and administers ROWs and permits for land use, and issues and administers material sales related to pipeline use on federal land.</p>	<p><i>Alaska Department of Natural Resources</i> Administers state-owned land and rights granted in land-use leases, permits, material sales, water rights, and water use.</p>
<p><i>DOT/Office of Pipeline Safety</i> Regulates the transport of hazardous liquids and gases by pipeline, regulates drug testing related to pipeline safety, and conducts inspections of TAPS.</p>	<p><i>Alaska Department of Environmental Conservation</i> Issues permits to operate facilities that could affect air quality, generate waste, and treat, store, and dispose of hazardous material; regulates these facilities; and approves oil spill contingency plans.</p>
<p><i>U.S. Environmental Protection Agency</i> Works in partnership with the Alaska Department of Environmental Conservation to administer regulatory programs such as the Clean Air Act, Clean Water Act, and Oil Pollution Act.</p>	<p><i>Alaska Department of Fish and Game</i> Regulates activities affecting fish passage, anadromous fish streams, and hazing of wildlife in connection with oil spills.</p>
<p><i>U.S. Coast Guard</i> Issues permits for structures over navigable waters and oversees vessels and terminal safety.</p>	<p><i>Alaska Department of Labor</i> Reviews practices and procedures pertaining to occupational safety and health; mechanical, electrical, and pressure systems; and wage and hour codes to protect APSC employees.</p>
<p><i>U.S. Army Corps of Engineers</i> Issues approvals of structures or activities in navigable waters, and placement of dredged or fill material in waters of the United States, including wetlands.</p>	<p><i>Alaska Division of Governmental Coordination</i> Coordinates the review of projects under the Alaska Coastal Management Program and consolidates state comments on NEPA issues.</p>
<p><i>DOI/Minerals Management Service</i> Manages the nation's natural gas, oil, and other mineral resources on the Outer Continental Shelf.</p>	<p><i>Alaska Department of Public Safety/State Fire Marshal's Office</i> Conducts fire and safety inspections, reviews plans, investigates fires, and provides safety education to the public.</p>
	<p><i>Alaska Department of Transportation/Public Facilities</i> Designs, constructs, and maintains primary and secondary land and marine highways and airports.</p>

focuses on problem prevention rather than emergency response and damage control. The monitoring program identifies deficiencies and establishes formal notifications of those deficiencies and correction expectations of APSC, imposes correction deadlines, tracks and retains information, and verifies results. The Federal Grant and State Lease provide the various agencies within JPO with the authority to require corrective action. Once an agency requires corrective action through the appropriate governmental process, the APSC must perform the required action and satisfy the government that the deficiency has been corrected. In some instances, performance may be completed through the Federal Grant and State Lease by the government and paid for by the TAPS Owners.

The CMP is a tiered process for monitoring TAPS activities and consists of several elements: surveillances, engineering reviews, assessments, and CMP reports. Surveillances are the most frequent and routine monitoring function and are used to verify compliance with the Federal Grant and State Lease and to identify situations that need to be corrected. The results of surveillances and engineering reports and studies are identified in assessments, which may include findings for corrective action. Assessment reports are broader in scope than surveillance reports and are the primary tool used to formally issue findings to APSC for corrective action. The APSC is responsible for addressing these findings, consistent with the requirements of the Federal Grant and State Lease.

The CMP reports provide the results of the surveillances and assessments and discuss APSC actions in response to these issues. The content of these reports builds on the findings and conclusions of previous reports, providing broader, more comprehensive information on the status of specific components or systems over a longer period of time. The JPO has issued 12 CMP reports to date. These reports are identified in Table 2, and brief descriptions of the information included in each report are provided in this table.

The last two CMP reports identified in Table 2 contain key information to support BLM's evaluation on the renewal application for the Federal Grant. The eleventh CMP report is a review of TAPS compliance with the requirements of the Federal Grant and State Lease, including the detailed stipulations (JPO 2002a). This report summarizes the comprehensive assessments performed by JPO over the last two years to examine compliance with all aspects of the legal and administrative provisions contained in the Federal Grant and State Lease. The detailed evaluations of these requirements are given in the extensive list of JPO letters, surveillances, assessments, and reports identified in the reference section of this CMP report.

The twelfth CMP report is a summary of activities conducted to date to evaluate and improve the monitoring and maintenance program for TAPS (JPO 2002b). The reliability centered maintenance (RCM) process was used to facilitate this effort. The RCM process was used to evaluate the monitoring and maintenance program by examining critical systems, identifying mechanisms for system functional failure, and determining the consequences of such failures. Once the mechanisms and consequences of system functional failure have been identified, maintenance actions can be defined to prevent or mitigate the effects of these failures. This CMP report describes the RCM process and summarizes the results of the 48 RCM studies on approximately 60 critical systems and subsystems that have been completed. The document also identifies areas that could be improved in the APSC maintenance program. The JPO intends that APSC continue to demonstrate a commitment to a maintenance strategy that ensures operational safety, environmental responsibility, and functional reliability throughout the operational life of TAPS. These two CMP reports and the references cited

TABLE 2 Reports Issued under the Comprehensive Monitoring Program

Title	Date	Subject
Management Evaluation of Alyeska Pipeline Service Company Employee Concerns Program and Joint Pipeline Office Oversight	March 1997	A management evaluation of the effectiveness of APSC's Employee Concerns Program and oversight by JPO, as well as JPO's hotline program. The evaluation was conducted from February 3 to 14, 1997.
Audit Report on Compliance and Effectiveness of Alyeska Pipeline Service Company's Program to Implement the Alaska Native Utilization Agreement of October 20, 1995	September 1997	An audit to (1) determine APSC's compliance with Section 29 of the Federal Grant and with the Alaska Native Utilization Agreement (Agreement) dated October 20, 1995; (2) assess the effectiveness of APSC's efforts to achieve the goals and intent of the Agreement; and (3) identify potential measures to improve APSC's performance related to employment, training, and education of Alaska Natives.
Alyeska Pipeline Service Company's TAPS Environmental Protection Program	March 1998	A review of APSC's environmental performance relative to some potentially significant environmental issues for TAPS.
Evaluation of Alyeska Pipeline Service Company's TAPS Employee Safety Program	April 1998	An evaluation of APSC's Employee Safety Program and examination of selected issues considered to be of potentially high risk to personnel.
Evaluation of Alyeska Pipeline Service Company's Project Performance for TAPS	September 1998	An evaluation to address whether APSC has implemented TAPS projects in accordance with approved project plans, designs, and regulatory requirements on the basis of surveillances and assessments from JPO oversight activities.
Evaluation of Alyeska Pipeline Service Company's Operation of the Trans-Alaska Pipeline System	February 1999	An evaluation of APSC's operation of TAPS focusing on activities that were problem orientated, with a heavy emphasis on unscheduled shutdowns and pipeline restarts. Also included were pipeline integrity issues and shutdowns related to communication failures from 1994 through 1998.
An Evaluation of Selected Portions of the TAPS Maintenance Program, January 1997 - April 1999	April 1999	An evaluation of APSC's maintenance program focusing on six functional areas: electrical, preventive, mainline valve, workpad civil maintenance and surveillance, slope stability, and mineral material sites. The evaluation was a result of JPO surveillances and assessments and addressed the period from January 1997 through April 1999.
A Look at Alyeska Pipeline Service Company's Operation of the Trans-Alaska Pipeline System, 1999/2000	February 2001	A review of APSC's operation of TAPS focusing on follow-up monitoring of issues identified in the February 1999 operations review. The review included the results of two assessments of APSC's Risk Management Program and an evaluation of significant operational incidents since the previous review.

TABLE 2 (Cont.)

Title	Date	Subject
TAPS Construction Program, 1999/2000	January 2001	A review of APSC's construction program focusing on the document revision process. The effectiveness of this process is integral to closure of Audit Action Item 1955 as well as compliance with the Federal Grant and State Lease requirement for maintenance of current and accurate records.
TAPS Maintenance Program, 1999/2000	January 2001	A review of APSC's maintenance program focusing on compliance requirements for maintenance of TAPS and strategies necessary to ensure long-term operational safety and reliability. The long-term viability and useful life of TAPS is directly related to monitoring and resultant maintenance activities.
A Comprehensive Monitoring Program Report Examining Grant & Lease Compliance for the Trans-Alaska Pipeline System	April 2002	A comprehensive examination of APSC's compliance with the requirements and stipulations included in the Federal Grant and State Lease.
Comprehensive Monitoring Program, TAPS Maintenance & Sustained Useful Life, January 2001 – May 2002	June 2002	A summary of activities conducted to date to evaluate and improve the monitoring and maintenance program for TAPS. Use was made of the Reliability Centered Maintenance process to facilitate this effort.

therein, along with the evaluations contained in Section 4 of this report, provide the information necessary to support BLM's preliminary conclusions on the appropriateness of renewing the Federal Grant.

Through the JPO structure, the BLM, ADNR, and other agencies within JPO oversee all aspects of TAPS operations to ensure compliance with the requirements and stipulations provided in the Federal Grant and State Lease, as well as with other federal and state laws and regulations. This monitoring is risk-based; more consequential activities are examined more often and more closely. Activities that have been problematic in the past receive priority for reexamination. The goal of risk-based oversight is to understand and observe those areas posing the greatest risk and having the most profound negative effects. This approach provides for the most cost-effective use of governmental resources for oversight activities.

The objectives of these oversight activities are to ensure environmental protection, public and employee safety, and pipeline integrity. These objectives are accomplished by ensuring that hardware and systems meet design and operational requirements, and that effective management controls and contingency plans are in place to operate the system safely and respond to off-normal or accident conditions in a timely and effective manner. More detailed information on JPO and these oversight activities can be obtained from the various CMP reports identified in Table 2, annual reports, and other documents prepared by JPO. The JPO Internet web site can be accessed at <http://www.jpo.doi.gov>.

In a separate activity, the APSC commissioned an independent review of its compliance with the requirements of the Federal Grant and State Lease by Det Norske Veritas (DNV) of Houston, Texas, in 2000. This review was undertaken to support its renewal application by evaluating specific compliance requirements and identifying areas where procedures for ensuring compliance could be improved. The DNV review identified a number of areas that could be improved, largely associated with APSC's management systems (DNV 2000). The APSC subsequently implemented a systems renewal project to revise its management systems to address the concerns identified in the DNV review. A follow-up review by DNV indicated that substantial progress had been made in resolving the identified deficiencies, and DNV indicated that they had "confidence that the project will meet all its objectives" (DNV 2002).

The JPO has been working with APSC in identifying the operational requirements and evaluating potential risks and consequences of component failures to specify and prioritize maintenance activities. The current APSC effort to improve integration of its management systems and the efficiency and effectiveness of specific business processes, such as budgeting, maintenance, engineering, and project management, should ensure that results are monitored and business processes are improved in the future. Portions of this management system enhancement effort are contained in an agreement between JPO and APSC dated March 6, 2002 (JPO and APSC 2002a).

3.4 PHYSICAL CONDITION OF TAPS

The TAPS was designed and constructed to function reliably and safely in the harsh environment of Alaska. While the construction of TAPS was a major undertaking, it relied on proven engineering design and construction techniques. Special features were incorporated into the design of the pipeline to address environmental conditions such as permafrost in the northern portion of the TAPS ROW. As the only oil transportation link to the North Slope, the pipeline had to have sufficient structural integrity to withstand arctic conditions over an indefinite period.

The TAPS incorporates design features to address issues associated with operation of a warm oil pipeline in permafrost conditions in a seismically active area. Design features included allowances for thaw settlement for buried pipeline segments, pipe movement for aboveground sections to provide for crude oil temperature changes over time, and analysis of soil creep or frost jacking on the VSMs. While the original Federal Grant was for 30 years (the maximum period allowed in Section 28 of MLA), the regulations note the likelihood of renewal should TAPS prove economically viable. No time period is identified or recommended in the regulations for renewing the Grant.

A 30-year time period was used in the early 1970s to evaluate the economic viability of this project. This time period is not the design life of TAPS, but rather a point of reference for economic considerations. The TAPS was designed to function safely for as long as oil could be economically extracted from the North Slope (Norton and Miller 2002).

The pipeline is constructed of three grades of steel with minimum yield strengths of 60,000, 65,000, and 70,000 pounds per square inch in two wall thicknesses (0.462 and 0.562 inches). The pipe is epoxy coated and taped for protection against corrosion. Additional corrosion-protection measures are incorporated for the portions of the pipe located belowground. Zinc ribbons are buried parallel to the underground pipe and are galvanically coupled to it to provide a sacrificial anode. Most sections of the underground pipe are further protected from corrosion by an impressed-current system.

The aboveground pipeline was built in a flexible trapezoidal configuration to allow for longitudinal expansion of the pipe to be converted to sideways movement; this configuration also accommodates pipe motion induced by an earthquake. Facilities in the pump stations and at the Valdez Marine Terminal were designed and constructed to engineering codes and specifications in place at that time. Electrical systems have since been upgraded to be in compliance with safety codes.

The TAPS facilities have been continually inspected, maintained, and upgraded since startup in June 1977. In addition to routine maintenance activities, a number of improvements have been made to TAPS. Table 3 identifies the major upgrades to TAPS. The total cost of the upgrades identified in Table 3 is about \$860 million. According to APSC, about \$1.2 billion has been spent on upgrade projects since 1987; the total cost of all projects over the lifetime of TAPS is approximately \$3 billion (TAPS Owners 2001b). These upgrades have improved the overall quality of the pipeline and reduced the likelihood for leaks or other failures in the future.

Current oversight activities combined with the APSC monitoring and maintenance program has resulted in a highly dependable system with minimal downtime. Since startup, the

TAPS has operated 99.6% of the time (TAPS Owners 2001b). The APSC believes that the pipeline could be operated indefinitely, provided due diligence is given to monitoring and maintenance activities (Norton and Miller 2002b). A key element of this program is the replacement of components to ensure system integrity or to take advantage of technological improvements and efficiencies. Much of the monitoring and maintenance program focuses on corrosion control, since this area is a likely mechanism for system failure. When necessary, sections of pipe have been repaired (sleeved) or replaced. The monitoring and maintenance program covers all aspects of TAPS operations. Given the current structure of TAPS, including its operations and oversight, the BLM is confident that the physical condition supports renewal of the Federal Grant for up to an additional 30 years, should a decision be made to renew the Grant.

4 EVALUATION

Section 2 of this report identified the requirements for renewal of the Federal Grant. The evaluation for renewal of the Federal Grant is a two-tier process. First, a decision needs to be made on appropriateness of renewing the Grant. Second, should a decision be made to renew the Grant, the duration of the renewal period needs to be determined. Separate criteria apply to each of these two considerations. A preliminary evaluation of the current status of TAPS in regards to these requirements is given in this section.

4.1 RENEWAL CRITERIA

Under Section 28 of MLA, there are two primary criteria and several subsidiary requirements that must be met if the Federal Grant is to be renewed. These are addressed as follows.

4.1.1 Primary Criteria

The two primary MLA criteria for determining whether the Federal Grant should be renewed are that TAPS be in commercial operation and that it be operated in compliance with all Grant requirements and stipulations.

4.1.1.1 Commercial Operation

The TAPS has been in continuous commercial operation since June 1977, and more than 13 billion barrels of crude oil have been transported through the pipeline to the Valdez Marine Terminal. The throughput increased continuously from 0.576 million barrels per day in 1977 to a maximum of 2.03 million barrels per day in 1988. North Slope oil production has declined steadily since 1988 at an average annual rate of about 4.4%, and the current throughput is about 1 million barrels per day. The total market value of the North Slope crude oil delivered to refineries through the end of 2001 is about \$446 billion (2000 dollars) (BLM 2002).

An additional 8.9 billion barrels of North Slope crude oil could be extracted over the next 30 years, should a decision be made to renew the Federal Grant for the maximum allowable period; the total market value of this oil is about \$374 billion (DOE 2001). This estimate of recoverable oil may be low, since additional reserves have traditionally been discovered in oil fields as they are developed, and technological improvements may increase the amount of oil that can be economically extracted. This estimate assumes continuing production from existing oil fields (until they are depleted) and the addition of oil from the Prudhoe Bay/Central Area in 2005, the Northeast National Petroleum Reserve-Alaska (NPR-A) in 2010, and the West NPR-A in 2015.

On the basis of this forecast, production levels are expected to increase slightly through 2005 and then begin a steady decline throughout the remainder of the renewal period, should the Federal Grant be renewed as requested by the TAPS Owners. This estimate does not include the production potential associated with currently withdrawn or prohibited areas of

NPR-A and the Arctic National Wildlife Refuge (ANWR). While TAPS is commercially viable on the basis of current and projected North Slope oil fields, development of new reserves beyond those identified here in the future would further increase the economic value of the pipeline.

An updated petroleum resource assessment of NPR-A was recently completed by the U.S. Geological Survey (USGS). This assessment indicates that there may be greater petroleum resources in NPR-A than previously estimated. The amount of technically recoverable, undiscovered oil beneath the federal part of NPR-A likely ranges between 5.9 and 13.2 billion barrels, with an expected value of 9.3 billion barrels (Bird and Houseknecht 2002). The impact of this updated estimate on potential future TAPS operations is being evaluated by BLM in their ongoing deliberations on the request for renewing the Federal Grant.

Continued commercial operation of TAPS is directly related to the economics of North Slope crude oil production. As long as the cost of extracting and transporting the oil is less than the price obtained for the oil, the oil fields and pipeline will remain economically viable. The economic life of TAPS also depends on the availability of sufficient throughput to maintain operations. It is estimated that with some modifications, the TAPS can operate by transporting as few as 0.2 million barrels per day. The current throughput of about 1 million barrels per day is estimated to increase slightly through 2005 and then steadily decline to 0.208 million barrels per day by 2034 (DOE 2001). The average annual throughput over the 30 years is about 0.810 million barrels per day. On the basis of current projections, North Slope oil production and TAPS operations are projected to be economically viable for a minimum of 30 more years.

The TAPS is expected to remain commercially viable into the foreseeable future, should a decision be made to renew the Federal Grant. There is sufficient North Slope crude oil to support commercial operations for at least 30 more years, and the pipeline can accommodate a wide range of crude oil throughput by a number of procedures, such as adjusting the number of operating pump stations and use of DRA.

4.1.1.2 Compliance

For the Federal Grant to be renewed, the TAPS must be in compliance with all Grant requirements and stipulations. Section 16 of the Federal Grant states that TAPS "shall comply with all applicable Federal laws and regulations, existing or hereafter enacted or promulgated." In examining compliance, the BLM must consider whether the TAPS Owners have made a good faith effort to abide by all applicable requirements to the extent possible and to respond in a timely manner to identified deficiencies.

The BLM is the agency responsible for a decision on renewal of the Federal Grant. As a member of JPO, the BLM participates in reviews and evaluations of all aspects of TAPS operations. In 2002, JPO completed a comprehensive review and evaluation of TAPS against specific regulatory requirements pertinent to operation of the pipeline. The JPO felt it prudent and important to conduct this review and evaluation as part of its oversight responsibilities. Although compliance, as used in the context of renewal of a ROW grant under Section 28 of MLA has a broader meaning than simply adherence to specific regulatory requirements, the BLM is using the results of this evaluation to support its deliberations on the renewal application for the Federal Grant.

The results of this comprehensive review and evaluation of TAPS compliance with the requirements of the Federal Grant and State Lease are documented in a CMP report (JPO 2002a). This report summarizes the extensive assessments performed by JPO over the last two years to examine compliance with all aspects of the legal and administrative provisions contained in the Federal Grant and State Lease. The detailed evaluations of these requirements are given in the extensive list of JPO letters, surveillances, assessments, and reports identified in the reference section of this CMP report.

This review indicated that all issues are resolved, have a path to resolution acceptable to JPO, or are targeted for evaluation using the RCM process. The JPO has used orders, notices, and findings to identify corrective actions required by APSC. The one notice and seven findings cited in the report have been closed to the satisfaction of JPO and BLM.

TABLE 4 Comprehensive Monitoring Program Open Findings (see page ii of Compliance CMP Report)

Section/Stipulation	JPO Report(s)	Closure Letter
Grant Section 9	JPO-00-A-006 ANC-01-A-003	One finding closed by letter 02-046-DG, dated June 27, 2002.
Grant Section 29	JPO-00-S-033	One finding closed by letter 02-090-DG, dated December 17, 2002
Stipulation 3.4.1.2	ANC-01-E-008 ANC-02-E-002	One finding closed by letter 02-079-DG, dated November 6, 2002
Stipulation 1.18.1 Stipulation 1.21	FBU-01-S-001	Three findings closed by letter 02-085-DG, dated November 14, 2002.
Stipulation 1.20	ANC-02-S-337	One finding closed by letter 02-059-DG, dated August 6, 2002

The BLM has three multiple-use land use plans that encompass portions of TAPS, as discussed in Section 1.4 of the DEIS (BLM 2002). The Southcentral Management Framework Plan was issued in 1980 and covers portions of TAPS on BLM lands south of the Alaska Range, but it does not discuss any management decisions affecting TAPS. The Fort Greely Resource Management Plan (RMP) was issued in 1994 and states that BLM will protect valid existing rights, including the TAPS ROW through this military installation south of Delta Junction. The Utility Corridor Proposed RMP notes the preeminence of the pipeline in the vicinity of TAPS on

land north of the Yukon River. This plan identifies energy transportation as the primary purpose for BLM-administered lands in the utility corridor.

The BLM has worked with a number of federal and state regulatory agencies to obtain reports on TAPS compliance with laws and regulations under their jurisdiction to support the renewal process for the Federal Grant. The DOT Office of Pipeline Safety (OPS) is responsible for administering that department's national pipeline safety regulatory program pursuant to 49 USC §§ 60101-60128. The pipeline safety requirements are codified in 49 CFR Parts 190-199. The purpose of the safety regulatory program is to assure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline. Since TAPS first began transporting crude oil, the OPS has routinely identified regulatory concerns on TAPS and issued Notices of Probable Violation (NOPV) as appropriate.

The OPS completed a review of TAPS performance and the status of safety compliance issues on June 13, 2002. In this review, the OPS noted that ASPC has consistently responded in resolving pipeline regulatory issues. While there are still some regulatory issues being addressed by APSC, the OPS "believes that these issues will be resolved satisfactorily and should not impact the continued safe operation of TAPS." The OPS concluded the review by a June 17, 2002 letter to BLM that stated no outstanding regulatory pipeline safety violations existed that would lead to not recommending renewal of the Grant. Based on this OPS review, the BLM has concluded that TAPS is in compliance with DOT requirements.

In a letter of June 14, 2001, to BLM, the U.S. Coast Guard issued a comprehensive safety assessment of the portions of TAPS under its jurisdiction. It concluded that APSC's marine operations were in compliance with applicable federal regulations and policies. In addition, the BLM received a letter from the U.S. Coast Guard on July 18, 2002, stating that the Bridge Administration Program found "no outstanding regulatory violations or other concerns with any of the numerous bridge structures along TAPS we previously authorized that would lead us to recommend against renewal of the Federal Grant of Right of Way" (Helfinstine 2002). This concluded the consultation process with the U.S. Coast Guard on renewal activities, and BLM determined TAPS is in compliance with U.S. Coast Guard requirements.

The BLM also consulted with FWS and NMFS for compliance with Section 7 of the Threatened and Endangered Species Act. This consultation was coordinated with the EIS process. The FWS sent a letter to BLM on June 18, 2002, agreeing with BLM's determination "that the proposed action, as described, is not likely to adversely affect Spectacled or Stellar's Eiders" (Bennett 2002). In addition, the NMFS sent a letter to BLM on July 1, 2002, indicating concurrence with BLM's conclusion that renewal of the Federal Grant "is not likely to adversely affect those listed species and critical habitat for which NMFS bears responsibility" (Balsiger 2002). These two letters of concurrence completed BLM's consultation process on threatened and endangered species.

The BLM consulted with the Alaska State Historic Preservation Officer (SHPO) to determine compliance with Section 106 of the National Historic Preservation Act. This consultation was coordinated with the EIS process. The BLM negotiated with the Alaska SHPO to develop a programmatic agreement to clarify procedures pertaining to cultural resources associated with future TAPS operations. The State Pipeline Coordinator's Office received an April 24, 2002 letter from the ADNOR Office of History and Archeology indicating that in terms of

cultural resources, "there are no compliance issues with Alyeska [ASPC] at this time" (Bittner 2002).

The BLM contacted the U.S. Department of Defense (DOD) with regard to any issues associated with renewal of the Federal Grant. The pipeline extends for 30 miles on land administered by DOD. The DOD facilities are managed by the U.S. Army Alaska (Forts Greely and Wainwright), the U.S. Air Force (Eielson Air Force Base), and the Alaska District of the U.S. Army Corps of Engineers (USACE). There are 20 miles of pipeline on Forts Greely and Wainwright; 7 miles of pipeline are on Eielson Air Force Base; and the remainder is on land managed by USACE for flood control. The Alaska District of USACE is responsible for coordinating TAPS renewal activities for DOD, including the three military installations.

The USACE concurred on renewal of the Federal Grant for land under its jurisdiction, and the base commander for Eielson Air Force Base committed to providing USACE with its decision on renewal by August 1, 2002. The U.S. Army Alaska and the U.S. Air Force completed an environmental baseline survey for TAPS prior to their final determination for renewal of the Federal Grant. The APSC must obtain permits from the Alaska District of USACE for placing dredged or fill material into waters of the United States, including wetlands, and for performing any construction or activity that alters navigable waters. On December 10, 2002, the U.S. Army Corps of Engineers sent a letter of non-objection to the 30-year renewal of the Federal Grant.

The U.S. Environmental Protection Agency (EPA) and Alaska Department of Environmental Conservation (ADEC) were contacted relative to TAPS compliance with laws under their jurisdiction. In an August 29, 2001 letter to BLM, EPA stated TAPS was in compliance with all applicable federal laws. On January 28, 2002, ADEC provided the State Pipeline Coordinator with a report, "Alaska Department of Environmental Conservation Enforcement Actions Involving APSC from 1999-2001. EPA and ADEC both concluded APSC had no pending violations.

Finally, the BLM has preliminarily concluded that TAPS is in compliance with all BLM and ADNR requirements, subject to reevaluation during the NEPA process.

On the basis of these considerations at this time, the BLM has preliminarily determined that TAPS is in compliance with all applicable laws, regulations, and Federal Grant requirements and stipulations for purposes of renewal of the Grant. There has been no history of serious misconduct demonstrating disregard for the law or a refusal to correct identified problems. When BLM/JPO identified deficiencies, the APSC has demonstrated a willingness to work with regulatory agencies to resolve the problem in a reasonable and timely manner. A number of issues are outstanding, but all have a path to resolution acceptable to JPO or are targeted for evaluation using the RCM process. BLM has completed all consultations with federal and state regulatory agencies to support renewal of the Federal Grant. Now that BLM has completed all consultations and the NEPA process, a decision will be made to determine whether TAPS is in compliance under Section 28 of the Mineral Leasing Act. This decision will be embodied in the Record of Decision.

4.1.2 Additional Requirements

Several additional requirements must be met for renewal of the Federal Grant. The BLM must be satisfied that the applicant has the technical and financial capability to operate, maintain, and terminate the project in an appropriate manner consistent with applicable requirements. The TAPS must be operated as a common carrier in accordance with federal antitrust laws, and all realty issues associated with the ROW must be resolved. Finally, the applicant should provide all plans, contracts, and agreements for future use of the pipeline as requested by BLM to support the renewal process. These conditions are addressed in the following discussion.

4.1.2.1 Applicant's Technical and Financial Capability

The pipeline has operated on a continuous basis since June 1977 with minimal downtime; since startup, it has operated 99.6% of the time. The TAPS employs about 2,000 workers, many of whom are trained engineers and technicians. The knowledge and experience gained over the last 25 years of operations are key to successful future activities. The applicants have a trained and experienced workforce to continue operating the pipeline in an effective and safe manner.

Each of the TAPS Owners maintains an undivided interest in the pipeline. The current ownership of TAPS is as follows: Amerada Hess Pipeline Corporation (1.5000%), BP Pipelines (Alaska) Inc. (46.9263%), ExxonMobil Pipeline Company (20.3378%), Phillips Transportation Alaska, Inc. (26.7953%), Unocal Pipeline Company (1.3561%), and Williams Alaska Pipeline Company, L.L.C. (3.0845%). These companies represent some of the largest corporations in the world and have very significant assets. The cost to construct TAPS was \$8 billion (1977 dollars), and APSC has indicated that about \$1.2 billion has been spent on upgrade projects since 1987. The total cost of all projects over the lifetime of TAPS is approximately \$3 billion, and the annual cost to operate and maintain these facilities is about \$400 million per year (TAPS Owners 2001b). In the past, the TAPS Owners have demonstrated a willingness to commit the resources necessary to continue operations in accordance with the requirements identified in the Federal Grant.

The TAPS Owners are required to provide an unconditional guaranty for operation of the pipeline as specified by the Secretary of the Interior. This requirement is identified in Section 15 of the Grant in Parts A and C as follows.

- A. Upon being notified by the Secretary to do so, each Permittee shall cause to be delivered to the Secretary a valid and unconditional guaranty of the full and timely payment of all liabilities and obligations of the Permittee to the United States under or in connection with this Agreement or any other agreement, permit or authorization to be issued or granted to the Permittees by the Secretary that relates in whole or in part to all or any part of the Pipeline System.
- C. Each guaranty shall be satisfactory to the Secretary in all respects including, without limitation, the form and substance of the guaranty, the financial capability of a proposed guarantor, the availability of such guarantor to service of process, the availability of the assets of such guarantor with

respect to the enforcement of judgments against the guarantor, and the number of guarantors that will be necessary to guarantee all of the liabilities and obligations which will be covered by a particular guaranty; *provided, however*, that the Secretary shall not unreasonably withhold his approval with respect to a guaranty or guarantor.

This requirement provides a mechanism for guaranteeing payment of all liabilities and obligations by the TAPS Owners as a condition for operating the pipeline, and that the TAPS Owners have the financial capability to meet these obligations.

The Williams Petroleum Company announced on June 18, 2002, its intention to sell its petroleum assets in Alaska, including a refinery at North Pole (near Fairbanks) and its stake in TAPS. However, such transfer of ownership cannot take place without the prior approval of the Secretary of the Interior, as noted in Section 22 of the Grant. Part A of Section 22 states

- A. Permittees, and each of them, shall not, without obtaining the prior written consent of the Secretary, Transfer in whole or in part any right, title or interest in this Agreement or the Right-of-Way. Any such Transfer other than with respect to an Involuntary Passage of Title, without in each instance obtaining the prior written consent thereto of the Secretary, shall be absolutely void, and, at the option of the Secretary, shall be deemed to be a breach of this Agreement by each Permittee so violating this Agreement.

No change in TAPS ownership can occur without the prior written approval of the Secretary of the Interior. The BLM and DOI have and will continue to carefully review any proposed changes in TAPS ownership relative to the financial strengths and liabilities of the companies comprising any new ownership arrangement.

4.1.2.2 Common-Carrier Requirements

The TAPS is to be operated as a common carrier and must accept, convey, transport, or purchase without discrimination and at reasonable rates all oil delivered to the pipeline without regard to whether it was produced on federal or private lands. The TAPS Owners have acted in accordance with this requirement. In addition to the oil developed by private firms on the North Slope, oil has recently been developed at the Northstar Unit located offshore of Point McIntyre and Point Storkersen in the Beaufort Sea for the federal government. This oil is currently being transported through TAPS in accordance with these requirements. No common-carrier issues have been identified since TAPS began operation in June 1977.

The Permittees operate as individual common carriers under the authority of the Federal Energy Regulatory Commission (FERC). Each Permittee has a current tariff on file with FERC. The tariffs may be reviewed and printed from the FERC website, www.ferc.gov. The current tariff for each is as follows:

Amerada Hess Pipeline Corporation, Supplement 12 to FERC Tariff 41, effective 1/1/03
 BP Pipelines (Alaska) Inc., Supplement 2 to FERC Tariff 26, effective 1/1/03
 ExxonMobil Pipeline Company, Supplement 2 to FERC Tariff 106, effective 1/1/03
 ConnocoPhillips: Phillips Transportation Alaska, Inc., FERC Tariff 11, effective 1/1/03
 Unocal Pipeline Company, Supplement 7 to FERC Tariff 189, effective 1/1/03
 Williams Alaska Pipeline Company, L.L.C., FERC Tariff 9, effective 1/1/03

4.1.2.3 Antitrust Issues

The TAPS is currently being operated in compliance with federal antitrust laws. The recent mergers of Exxon Corporation and Mobil Oil Corporation in 1999, and BP and ARCO in 2000, raised concerns relative to the production, delivery, and sale of North Slope crude oil that had to be resolved before the mergers could be approved. One of the conditions imposed by the Federal Trade Commission (FTC) in the merger of Exxon Corporation and Mobil Oil Corporation was the divestiture of Mobil Oil's interest in TAPS. Mobil Oil Corporation previously owned 3.0845% of TAPS; the Williams Alaska Pipeline Company, L.L.C., acquired this interest. The ExxonMobil Pipeline Company currently owns 20.3378% of TAPS, which was the interest owned by Exxon Pipeline Company prior to the merger.

The merger between BP and ARCO had more significant antitrust concerns, given that these two companies were the two largest producers of North Slope crude oil. These two companies were also the two largest owners of TAPS; BP owned 50.0108% of TAPS and ARCO owned 22.2950%. The FTC and the Attorneys General of Oregon, Washington, and California filed suit in federal district court to block the merger of these two companies, alleging that the merger would lessen competition and production of North Slope crude oil and allow for the unfair manipulation of the price of oil sold to West Coast refineries.

The case was settled and required the divestiture of all of ARCO's Alaska assets, including oil and gas interests, six existing oil tankers under construction, three tankers being built, real estate exploration data, selected long-term supply agreements, and all interest in TAPS. These assets were acquired by Phillips Petroleum Company, which previously owned 1.4158% of TAPS. Following the merger, Phillips Transportation Alaska, Inc., owned 23.7108% of TAPS. Phillips Transportation Alaska, Inc., subsequently acquired an additional 3.0845% ownership of TAPS from BP, so that it now owns 26.7953% of the pipeline; BP Pipelines (Alaska) Inc. currently owns 46.9263% of TAPS.

Phillips Petroleum Company is the major supplier to Puget Sound refineries, which are the primary suppliers of gasoline to Oregon and Washington. Much of BP's North Slope crude oil is now used in the former ARCO refineries in Los Angeles and Puget Sound, thus eliminating BP as the dominant supplier of North Slope crude oil to other West Coast refineries. By securing BP's divestiture of ARCO's Alaska assets to Phillips Petroleum Company, the FTC said it retained "an independent competitive force with the incentive to find and deliver additional ANS [Alaska North Slope] crude oil" (FTC 2001).

The actions required by the FTC were implemented as part of the merger actions. As far as is known at this time, the current TAPS Owners are in compliance with all federal antitrust laws.

4.1.2.4 Realty Provisions

Renewal of the Federal Grant is a major Department of the Interior realty action. The Secretary of the Interior or her delegate is responsible for administering and renewing approximately 426 miles of TAPS ROW, of which 375 miles are on land owned by the federal government and 51 miles are on land conveyed to Alaska Native Regional Corporations under the Alaska Native Claims Settlement Act of 1971. The remainder of TAPS is located on land owned by the State of Alaska (344 miles), the TAPS Owners (8 miles), and other private entities (22 miles). Of the land owned by the federal government, 30 miles are on land administered by DOD and the remainder is administered by BLM. The realty functions performed by DOI include reviewing the renewal application submitted by the TAPS Owners, reviewing land-ownership issues associated with the existing ROW, preparing the updated Federal Grant as appropriate, and notifying the public of ongoing renewal activities.

The application for renewal of the Federal Grant was received from the TAPS Owners on May 2, 2001. The application was reviewed for completeness, and BLM notified the applicant by letter on May 31, 2001, that the application met the requirements for content given in 43 CFR 2882.2-3 and adequately addressed the questions posed on Standard Form 299, *Application for Transportation and Utility Systems and Facilities on Federal Lands*, to proceed with further processing of the application (DOI 2001a). The BLM has conducted an extensive review of land ownership for the entire length of TAPS from PS 1 to the Valdez Marine Terminal. The review included state and federal public land records, federal mining claims, and the TAPS Owners' recorded access rights across private lands. The review was coordinated with the State of Alaska, affected DOD agencies, and Alaska Native Regional Corporations. The TAPS crosses or borders 10 Native allotments.

In addition to reviewing public land records, the BLM made direct contact with the DOI Bureau of Indian Affairs and the involved Native allottees to discuss the TAPS renewal process. There are 21 substantially and directly affected Alaska Native Tribes along the TAPS ROW. They have been consulted on a government-to-government basis as part of the EIS process. In 2002, the BLM conducted field inspections of the 175 TAPS access roads on federal land. The reviews, consultations, and field examinations indicate that the TAPS Owners have legal rights to operate the full length of the pipeline, except for one-half mile across a Native allotment. The TAPS Owners have been negotiating with the allotment owner to obtain access rights. If necessary, the TAPS Owners can acquire access rights across the allotment by condemnation as an agent of the State of Alaska. To be entitled to renewal, the TAPS Owners must demonstrate legal right-of-way for the entire system. The BLM cannot renew the Federal Grant until the TAPS Owners demonstrate this.

The public has been kept apprised of ongoing renewal activities as required by law. A notice of the renewal application was published in the *Federal Register* on May 21, 2001 (DOI 2001b). This notice contained a brief description of TAPS and identified the current ROW in detail. This notice was also published in the *Anchorage Daily News* and 11 other newspapers in Alaska between May 30 and June 7, 2001. Other public notices for TAPS renewal include scoping for the EIS process, and notices of availability of the DEIS and FEIS for public review. These notices have also been published in newspapers throughout Alaska, in the Federal Register and on the JPO and Argonne websites. The FEIS includes a copy of the current Federal Grant.

4.1.2.5 Future Plans

43 CFR 2883.1-5(c) notes that prior to renewal of the Federal Grant, the applicant is to submit and disclose all plans, contracts, agreements or other information or material necessary to determine whether the Grant shall be renewed, and the terms and conditions that should be included in the Grant, as requested by BLM. Such information may include conditions regarding the addition of pumping facilities, looping, or otherwise increasing the pipeline throughput capacity; conditions for adding or abandoning intake, offtake, or storage points or facilities; and minimum shipment or purchase tenders.

The future use of TAPS would be a continuation of its current use as an oil pipeline linking North Slope oil fields to in-state refineries and to the Valdez Marine Terminal, should the Federal Grant be renewed. Changes to TAPS operations are expected in response to projected throughput decline, required maintenance and repairs, and future system upgrades. These changes were identified in information provided by the TAPS Owners in support of the renewal application and are summarized here (TAPS Owners 2001a). Additional changes to TAPS operations beyond those identified here will likely be made in the future in response to changing market conditions and technological improvements in the O&M of oil pipelines. All changes to TAPS operations will be subject to review and approval by JPO.

Changes to TAPS due to lower crude oil throughput and changing stream characteristics are anticipated to involve placing additional pump stations on standby status, and DRA equipment/injection enhancements to optimize hydraulic performance. Other changes may include leak detection improvements or modifications necessitated by cooler crude oil. Fewer pump stations are needed to move crude oil through TAPS at lower throughputs, and PS 7 and 12 are likely candidates to be put on standby status in the next 5 to 10 years. PS 1, 3, 4, and 9 are necessary to move oil through TAPS at any throughput and cannot be shut down while TAPS is in operation. As throughput declines to the point that an upstream pump station using DRA can compensate for the hydraulic requirements for a downstream station, the downstream station will become a candidate for being placed on standby status.

In 2000, the TAPS transported about 1 million barrels per day using seven mainline pumps at five pump stations with 10 online spare pumps. At throughputs less than 830,000 barrels per day, only four pumps at four pump stations are required. In this case, a potential system configuration could include PS 1, 3, 4, and 9 operating with one mainline pump unit each, and PS 5 operating as a relief facility and cold restart contingency. PS 7 and 12 would be kept on standby with provision for cold restart. PS 5 could be placed on standby status when throughputs declined to less than 380,000 barrels per day (TAPS Owners 2001a).

Once pump stations are isolated from the pipeline, they are placed on standby status, which would allow restarting within 180 days in the event of an unanticipated throughput increase or a contingency event at an adjacent station. The 180-day period for restarting a pump station is a requirement imposed by JPO. Pump station facilities and insulation on the aboveground sections of the pipeline are designed to permit restarting of crude oil flow after a prolonged winter shutdown. The primary concern is the impact from gelled crude oil and freezing water in the pipeline at cold temperatures. Crude oil flow must be able to be restarted following a 21-day shutdown with an ambient air temperature of -40°F and a wind velocity of 20 miles per hour. The 21-day shutdown period was selected by JPO as the design condition that must be met, because it is the estimated time required to make major repairs to TAPS.

Maintenance and repair procedures may change in the future in response to modifications made to the pipeline. An instrumented internal inspection of the pipeline is currently performed every 3 years to measure corrosion or wall thinning and to identify areas requiring additional inspection. This internal inspection is performed by use of a "smart pig." Additional pig runs are performed more frequently to clean the interior of the pipeline. The frequency of pig runs may change in the future as part of updating the monitoring and maintenance program.

Over the past 5 years, an average of 14 digs of buried pipeline have been performed each year for detailed inspection of potentially corroded pipe. The number of digs may increase to 20 per year over the next 30 years (TAPS Owners 2001a). However, depending on the performance of the impressed-current cathodic protection system installed along the pipeline, the number of digs may remain constant or possibly decline. In addition, several sections of pipe (about 4 miles total) are buried in thaw-unstable soils for big game passage and a highway crossing. These areas are mechanically refrigerated to prevent thawing of the soils surrounding the warm pipe with possible settlement of the pipeline. Mechanical refrigeration systems may require replacement or upgrade for improved performance and durability in the future.

The TAPS mainline valves are periodically tested and, as necessary, repaired or replaced. Future valve replacements may include upgrades to improve functionality and durability. The mainline pumps are centrifugal and driven by turbines on variable speed control. As such, they perform efficiently across a wide range of flow rates. Modifications were made to the pumps to gain increased performance at peak throughputs. The pumps may be modified in the future to maintain optimum performance at the lower throughputs. In addition, as throughput declines, the number of spare pumps increases.

Future upgrades of TAPS may also include improvements to communications systems and pipeline control systems, as well as initiatives to further automate remaining pump stations. The TAPS voice and data communications systems are undergoing significant changes. The existing analog microwave system is being upgraded to a more modern and technically superior digital microwave system for critical control-system communications. A fiber-optic communication system has been installed along the TAPS ROW, and this network is currently used for noncritical voice and data communications.

Significant advances in pipeline control have been made since the current TAPS control system was installed. The APSC expects to upgrade this system to take advantage of faster, higher-volume, better-quality information. New control systems offer improved sharing of data that are projected to increase efficiency and safety of operation. Finally, many pump station activities currently require manual intervention, data collection, interpretation, or decision making that are suitable for automation, and upgrades of these systems could occur in the future.

The changes in TAPS operations in response to projected throughput decline, maintenance and repairs, and system upgrades given here are indicative of those expected to occur in the next several years. It is not possible to identify all such changes that may occur during the next 30 years, the maximum period for renewal of the Federal Grant. North Slope oil production levels are expected to increase slightly through 2005 and then begin a steady decline. The discovery of new oil fields on the North Slope or development of reserves from

currently withdrawn or prohibited areas could result in an increase in throughput, rather than a decline as discussed here. The TAPS has a high degree of flexibility to accommodate a wide range of crude oil throughput and can accommodate both increases and decreases to the current throughput. In addition, it is not possible to determine what advances may occur in technologies for detection of pipeline corrosion, leaks, telecommunications, and computer applications in automating the operation of TAPS. As new approaches to operating TAPS are identified, the JPO will evaluate each approach for applicability to improve the operation and safety of the system. No changes will be made to the physical condition of TAPS or the manner in which it is operated and maintained without review and approval by JPO.

4.2 DURATION CRITERIA

Duration criteria consist of those factors that need to be considered by BLM in determining the maximum time period for renewal of the Federal Grant, should a decision be made to renew the Grant. As noted in Section 2, the Federal Grant shall be renewed for a reasonable period, not to exceed 30 years nor for a time period longer than is necessary to accomplish the purpose of the Grant. 43 CFR 2881.1-1(e) notes that in determining the duration of the renewed Grant, the BLM shall take into consideration the cost of the facility, its useful life, any public purpose it serves, and potentially conflicting uses of the land. The TAPS Owners have requested that the Federal Grant be renewed for an additional 30 years. The four criteria for determining the duration of the renewal period are addressed as follows.

4.2.1 Cost of TAPS

The cost to construct TAPS was \$8 billion (1977 dollars), and it represents one of the largest construction projects ever completed. The \$8 billion cost estimate includes the cost for construction of the pipeline proper, the 11 pump stations, the Valdez Marine Terminal, and all related facilities. The cost does not include interest on capital investment nor capital construction projects after 1977 (APSC 2002).

According to APSC, about \$1.2 billion has been spent on upgrade activities since 1987 (see Table 3 for the costs associated with major upgrade projects). The total cost of all projects over the lifetime of TAPS is approximately \$3 billion, and the annual cost to operate and maintain these facilities is about \$400 million (TAPS Owners 2001b). Significant capital expenditures and maintenance costs are expected to continue in the future, should a decision be made to renew the Federal Grant. These facilities represent a major investment on the part of the TAPS Owners and provide the only realistic means for transporting crude oil from the North Slope to the Lower 48 States at this time.

4.2.2 Useful Life of TAPS

The useful life of TAPS is the length of time that it can be used to transport oil from the North Slope to the Valdez Marine Terminal in a safe manner. While the useful life is largely related to the physical condition of the TAPS components, some considerations of economic life (which is related to the amount of oil remaining in the North Slope oil fields and the ability to

extract it and transport it to market in a cost-effective manner) need to be addressed in this evaluation. The physical life of TAPS is related to both the manner in which it was designed and constructed and the ongoing monitoring and maintenance program. A comprehensive and effective monitoring and maintenance program for TAPS is essential to extending the time period over which it can operate safely.

More than 13 billion barrels of crude oil has been extracted from the North Slope and transported through the pipeline to the Valdez Marine Terminal. An additional 8.9 billion barrels of crude oil could be extracted over the next 30 years, the maximum period for renewal of the Federal Grant. The current TAPS throughput is approximately 1 million barrels per day, and current projections are that this throughput will increase slightly through 2005 and then begin a steady decline to 0.208 million barrels per day by 2034 (DOE 2001). The TAPS has sufficient flexibility to accommodate these throughput fluctuations by a number of procedures, such as adjusting the number of operating pump stations and use of DRA. It is estimated that with some modifications, the TAPS can operate by transporting as few as 0.2 million barrels per day. The United States currently consumes close to 20 million barrels of petroleum products per day, and this consumption is projected to increase in the future (NEPDG 2001). On the basis of current projections for the amount of North Slope oil reserves, the flexibility for using TAPS to transport this oil to the Valdez Marine Terminal, and domestic needs for this oil, the economic life of TAPS is expected to extend for a minimum of 30 more years.

The oil industry needs long-term certainty regarding the availability of TAPS to properly plan and finance future activities. It is not reasonable to expect oil companies to expend significant resources to develop oil fields on the North Slope without knowing that a transportation system will be in place to get the oil to market. It is also important for the TAPS Owners to know that there is a reasonable period of time to allow for a return on their investment (in terms of new expenditures to upgrade operations of TAPS). New oil field development typically includes a 10- to 12-year exploration and development cycle, from lease acquisition through seismic evaluations, exploration activities, project approval and permitting, and finally development and operation. Before beginning this process, the oil industry must have a high degree of confidence that once a field is in operation, the transportation infrastructure will not cut short the 15- to 20-year production life necessary to justify the project. Such considerations, along with the large cost to operate and maintain TAPS, support renewal of the Federal Grant for an additional 30 years.

The physical life of TAPS can be extended almost indefinitely by use of an aggressive monitoring and maintenance program (Norton and Miller 2002). Inspection of the pipeline (both visually and remotely by use of pigs) can help identify problem areas before leaks or other failures occur. Any failures that do occur can be repaired more quickly if discovered early. Replacement of worn or aging components is a key element of the monitoring and maintenance program. A number of technological improvements have been made since the pipeline was constructed to assist with inspection of the pipeline and other TAPS facilities. These include improved techniques to detect curvature and corrosion of the mainline pipe.

The TAPS was constructed more than 25 years ago. While age itself has no metallurgical effect that would cause degradation of the strength and ductility of steel, the age of a pipeline can influence the potential for failures by corrosion, fatigue, and manufacturing and construction defects. These are countered on TAPS through surveillance and maintenance programs to identify flaws in coatings; provide adequate cathodic protection; and monitor pipe

conditions through in-line inspection (by pigs), visual inspections, alarm systems, and electronic surveillance. Pumps, turbines, and other components of the system are repaired and replaced as required. If these age-related effects are properly controlled, the physical life of the steel pipe is considered to be essentially unlimited (Norton and Miller 2002).

Corrosion of buried sections of pipeline with subsequent failure of its integrity is a concern that has received vigilant oversight and review by JPO. The most common factors that have contributed to TAPS corrosion are moisture, construction defects, damaged coating, oil temperature, and ineffective cathodic protection. An instrumented pig first identified corrosion of the pipeline in 1987. Subsequent pig runs and verifications revealed corrosion was serious enough to warrant corrective action, including the replacement of 8.5 miles of pipeline in the Atigun River floodplain in 1991. More than 150 repair sleeves have been installed over the life of the pipeline to address problems caused by corrosion and settlement (APSC 2002). Pigging technology continues to improve, and the APSC typically spends about \$25 million to \$50 million per year to detect and control corrosion problems on the pipeline (Norton and Miller 2002).

The APSC is using the RCM process as a core maintenance strategy for TAPS system and subsystem function preservation. The RCM process is a highly prescriptive methodology used to identify the maintenance needs of a physical asset to ensure operational safety, environmental responsibility, and functional reliability. This approach is also used by the airline industry. The BLM and ADNR entered into a formal agreement with APSC on January 19, 2001, to work cooperatively in implementing the RCM process to evaluate critical TAPS systems (JPO and APSC 2001). To date, 48 RCM studies on approximately 60 critical systems and subsystems have been completed. The JPO and APSC maintain detailed reports on the results of each RCM analysis. This agreement also required APSC to correct items identified as having safety, environmental, and integrity deficiencies.

The APSC has performed maintenance measures on TAPS facilities as necessary to promote safe and efficient operation of the pipeline since 1977. The importance of a proactive maintenance program to ensure the reliability of individual TAPS components and the functionality of the entire system increases as the system ages. The JPO is working with APSC to improve existing maintenance procedures by implementing a methodology similar to RCM to identify maintenance actions necessary to preserve the functions of TAPS systems and subsystems. The BLM and ADNR entered into a formal agreement with APSC on June 27, 2002, to implement such a methodology to improve the maintenance procedures employed on TAPS (JPO and APSC 2002b). Such a comprehensive maintenance program should help ensure the operational safety and functional integrity of TAPS for the duration of the renewal period, should a decision be made to renew the Federal Grant (JPO 2002b).

The regulatory agencies comprising JPO have and will continue to issue orders to compel corrective action as necessary. Such orders are designed to correct unsafe conditions to ensure pipeline integrity and worker safety prior to the occurrence of accidents. The oversight activities focus on the maintenance requirements and strategies necessary for operational safety, environmental responsibility, and functional reliability of TAPS systems and equipment. The physical life of TAPS is projected to be at least an additional 30 years, provided a proactive monitoring and maintenance program is continued. Detailed information on the monitoring and maintenance program is given in JPO (2002b).

4.2.3 Public Purposes Served

Section 202 of TAPAA notes the importance of TAPS in meeting the national energy needs. This section states that the “development and delivery of oil and gas from Alaska’s North Slope to domestic markets is in the national interest because of growing domestic shortages and increasing dependence upon insecure foreign sources” and that TAPS will make North Slope oil “available for domestic use and will best serve the national interest.” The United States imported about 10 million barrels of oil per day in 2000, which is about twice the amount imported in 1973 when TAPAA was passed by Congress (NEPDG 2001). The TAPS throughput is about 1 million barrels per day, which is approximately 17% of the current domestic crude oil production. If construction and operation of TAPS were determined to be in the national interest in 1973, continued operation of this pipeline is clearly still in the national interest to limit the country’s increased dependence on imported oil.

The importance of TAPS was identified in a report developed by the National Energy Policy Development Group (NEPDG) for President George W. Bush. The NEPDG called TAPS “the single most important crude oil pipeline in the United States” and recommended that DOI implement “the most expeditious process for renewal of the Trans-Alaska Pipeline System rights-of-way to ensure that Alaskan oil continues to flow uninterrupted to the West Coast of the United States” (NEPDG 2001). Continued operation of TAPS is important to ensure a secure and adequate supply of energy on the West Coast. In addition, the TAPS is a vital component of the country’s energy infrastructure; it is not realistic to develop the remaining North Slope oil reserves without TAPS.

Current estimates indicate that an additional 8.9 billion barrels of oil could be extracted from the North Slope oil fields over the next 30 years (DOE 2001). This estimate does not include the production potential associated with currently withdrawn or prohibited areas of NRP-A and ANWR. The importance of TAPS increases significantly should development of these areas occur in the future, as recommended by NEPDG (2001). A recent USGS assessment indicates that there may be greater petroleum resources in NPR-A than previously estimated (Bird and Houseknecht 2002). If correct, these estimates further validate the importance of TAPS.

The TAPS also improves national security by making petroleum products available to the military and reducing dependency on imported oil. Pipelines and oil and gas production and storage facilities were identified as assets critical to national security in Presidential Decision Directive 63, which was issued on May 22, 1998. This directive states that certain national infrastructures such as highways, electric power facilities, water supplies, rail lines, pipelines, etc., are critical to the national and economic security of the United States and the well-being of its citizenry, and that the United States should take all necessary measures to protect them. The TAPS is included on the list of critical infrastructures (TAPS Owners 2001b).

Since its startup in June 1977, the TAPS has made a significant contribution to the national economy through domestic oil production and the generation of substantial tax revenues and royalties to the federal government. In addition, North Slope crude oil has benefited specific sectors of the economy, notably marine tanker transportation, with the majority of the crude oil being delivered to West Coast ports for refining and distribution. (Less than 5% of the crude oil transported through TAPS was exported to the Far East, primarily to South Korea, Japan, and China from 1996 through 2000; such exports are not occurring at

present.) Under the Merchant Marine Act of 1920 (commonly called the Jones Act), all shipments between domestic ports must be on vessels built and registered in the United States and crewed by U.S. merchant seamen. More than 50 tankers were built during the 1970s and 1980s to transport North Slope crude oil; construction of each tanker requires approximately 1,000 shipyard workers for a period of 18 months. It has been estimated that in 1988, the year of maximum TAPS throughput, tankers employed about 2,600 full-time equivalent seamen (BLM 2002, TAPS Owners 2001a).

The United States currently imports more than 60% of its oil from other countries. Dependency on oil from outside the United States can create significant foreign policy issues if the countries supplying the oil are politically and/or economically unstable. In addition, this dependency has large implications for the balance of trade the United States has with the rest of the world. As a result of TAPS, crude oil imports have been reduced by more than 13 billion barrels from 1977 through 2001. This reduction in imported crude oil has decreased the trade deficit by approximately \$446 billion (2000 dollars) over this time period (BLM 2002).

The federal government obtains revenues from North Slope oil through corporate income taxes paid by the TAPS Owners and oil producers and through federal royalties on oil developments. In addition, windfall profit taxes were levied on oil producers between 1980 and 1988. It is estimated that North Slope oil and TAPS contributed more than \$40 billion to the federal government from 1977 through 1998, an average of \$1.8 billion per year (BLM 2002).

The TAPS has had a transforming impact on revenues in the State of Alaska. The number of individuals employed in North Slope oil activities peaked at slightly more than 9,000 workers in 1991 and has decreased in recent years due to falling production and cost-saving measures. Current TAPS employment is about 2,000 workers, including both employees and contractors. State revenues from North Slope oil were \$54.2 billion from 1977 through 1998; revenues attributable to North Slope oil production totaled \$51.3 billion, and revenues from TAPS operations were \$2.9 billion. Most production revenues come from the severance tax and state royalties, while both production and transportation through TAPS contribute to the state property tax and the corporate income tax. Most revenues have been deposited in the state general fund, but part of the royalties and settlements has gone into the Alaska Permanent Fund and the Constitutional Budget Reserve, which were established to save part of the revenues from depleting nonrenewable assets such as petroleum (TAPS Owners 2001a).

Local governments have received \$4.4 billion in revenues from 1977 through 1998 directly from production and transportation of North Slope oil. This sum represents the portion of the state property tax on oil and gas production and transportation facilities that is shared with the local governments of the North Slope Borough, Fairbanks North Star Borough, Valdez, and Anchorage. Revenues attributable to North Slope oil production totaled \$3.9 billion, and revenues from TAPS operations were \$470 million (TAPS Owners 2001a).

4.2.4 Potentially Conflicting Uses of Land

The TAPS ROW is currently used solely for the pipeline. The width of the ROW ranges from 54 to 300 feet. The width is 54 to 64 feet on federal lands (54 feet for buried pipe and 64 feet for elevated pipe), 100 feet on State of Alaska lands, and 54 to 300 feet on private lands. There are no potentially conflicting uses of the land; the only use currently envisioned would be

for one or more gas pipelines on the existing TAPS ROW corridor to carry North Slope natural gas.

5 CONCLUSIONS

This report presents the results of BLM's preliminary evaluation of the current status of TAPS in regard to the specific requirements for renewal of the Federal Grant under Section 28 of MLA. For renewal, the TAPS must be in commercial operation and in compliance with the Federal Grant requirements and stipulations, including applicable laws and regulations. The TAPS is currently in commercial operation and more than 13 billion barrels of crude oil has been extracted from the North Slope and transported through the pipeline to the Valdez Marine Terminal. An additional 8.9 billion barrels of crude oil could be extracted over the next 30 years (DOE 2001), the maximum period for renewal of the Federal Grant. This estimate of recoverable oil may be low, since additional reserves have traditionally been discovered in oil fields as they are developed, and technological improvements may increase the amount of oil that can be economically extracted. A recent USGS assessment indicates that there may be greater petroleum resources in NPR-A than previously estimated (Bird and Houseknecht 2002). This estimate on 8.9 billion barrels does not include the production potential associated with currently withdrawn or prohibited areas of NPR-A and ANWR.

The current TAPS throughput is approximately 1 million barrels per day, and current projections are that this throughput will increase slightly through 2005 and then steadily decline to 0.208 million barrels per day by 2034. The TAPS has sufficient flexibility to accommodate these throughput fluctuations by a number of procedures, such as adjusting the number of operating pump stations and use of DRA. The United States currently consumes close to 20 million barrels of petroleum products per day, and this consumption is projected to increase in the future (NEPDG 2001). On the basis of current projections for the amount of North Slope oil reserves, the flexibility for using TAPS to transport this oil to the Valdez Marine Terminal, and domestic needs for this oil, the economic life of TAPS is expected to extend for a minimum of 30 more years.

The BLM has preliminarily determined that TAPS is in compliance with the Federal Grant requirements and stipulations for purposes of renewal of the Grant. There are no outstanding citations or orders for violation of Grant requirements and stipulations, or violations of applicable laws. (Although the DOT OPS periodically issues NOPVs, the OPS has indicated that there are no outstanding or emerging regulatory pipeline safety issues that present a barrier to grant renewal.) In addition, there has been no history of a refusal to correct identified problems or to comply with applicable laws. When JPO has identified deficiencies, the APSC has demonstrated a willingness to work with regulatory agencies to resolve the problem in a reasonable and timely manner. A number of outstanding operational issues remain, but all have a path to resolution acceptable to JPO or are targeted for evaluation using the RCM process. All BLM consultations with federal and state regulatory agencies to support renewal of the Federal Grant have been completed. Now that the NEPA process is completed, the BLM is currently deciding whether TAPS is in compliance under Section 28 of MLA.

The TAPS Owners meet the additional requirements for renewal of the Federal Grant. The TAPS Owners have the technical and financial capability to operate, maintain, and terminate the project in an appropriate manner consistent with applicable requirements. The TAPS Owners have the capability to correct currently unforeseen problems and have made all necessary upgrades and modifications as identified by JPO. Since TAPS began operation in June 1977, it has been operated as a common carrier and in compliance with federal antitrust

laws. The Permittees' right to operate the TAPS was examined from the stand point of property interests. The Permittees produced, for inspection by BLM, evidence of their right to operate the TAPS for its entire length after renewal of the Federal rights-of-way and the State Lease, except for three limited instances. Two access roads cross lands that have been conveyed to Chugach Alaska Corporation and BLM waived the right to administer those rights-of-way, AA-8838 and AA-9462, in favor of Chugach Alaska Corporation. Chugach Alaska Corporation is responsible for the renewal of those rights-of-way. One half mile of the main pipeline crosses a Native allotment. The Permittees are currently negotiating with the allottee and the Department of the Interior Bureau of Indian Affairs to acquire a right-of-way over that property. Finally, the applicant has provided plans for future operation of the pipeline (largely associated with a projected reduction in crude oil throughput) in its application for renewal of the Federal Grant.

In determining the duration of renewal, the BLM shall take into consideration the cost of the facility, its useful life, any public purpose it serves, and potentially conflicting uses of the land. The duration of renewal shall be for a reasonable period, not to exceed 30 years nor for a time period longer than is necessary to accomplish the purpose of the Grant. The cost to construct TAPS was \$8 billion (1977 dollars), and it represents one of the largest construction projects ever completed. According to APSC, about \$1.2 billion has been spent on upgrade activities since 1987. The total cost of all projects over the lifetime of TAPS is approximately \$3 billion, and the annual cost to operate and maintain these facilities is about \$400 million per year (TAPS Owners 2001b). Significant capital expenditures and maintenance costs are expected to continue in the future, should a decision be made to renew the Federal Grant. These facilities represent a major investment on the part of the TAPS Owners and provide the only realistic means for transporting North Slope crude oil to the Lower 48 States at this time.

The physical life of TAPS can be extended well beyond 30 years by use of an aggressive monitoring and maintenance program. Since TAPS was constructed more than 25 years ago and functions in a harsh arctic environment, an extensive monitoring and maintenance program is essential for ensuring pipeline integrity. Elements of this program include procedures to identify flaws in coatings; to provide adequate cathodic protection; and to monitor pipe conditions through in-line inspection (by pigs), visual inspections, alarm systems, and electronic surveillance. Pumps, turbines, and other components of the pipeline are repaired and replaced as required. More than 150 sleeves have been welded over cracks in the pipeline (such as caused by settlement) and small segments of corroded pipe. The physical life of TAPS is projected to be a minimum of 30 more years, provided that APSC's monitoring and maintenance program is continued with vigilant JPO oversight. Detailed information on the monitoring and maintenance program is given in JPO (2002b).

A number of public purposes are served, including the economic benefits to the country and State of Alaska from the jobs and tax revenues generated by the operation of TAPS. Continued operation of TAPS is important to ensure a secure and adequate supply of energy on the West Coast. In addition, the TAPS is a vital component of the country's energy infrastructure; it is not realistic to develop the remaining North Slope oil reserves without TAPS. The TAPS also improves national security by making petroleum products available to the military and reducing dependency on imported oil. As a result of TAPS, crude oil imports have been reduced by more than 13 billion barrels from 1977 through 2001. This reduction in the amount of imported crude oil has reduced the trade deficit by approximately \$446 billion (2000 dollars) over this time period. There are no potentially conflicting uses of the land; the only use

currently envisioned would be for one or more gas pipelines on the existing TAPS ROW corridor to carry North Slope natural gas.

The conclusions presented here are preliminary and subject to change pending completion of the deliberations on the renewal application. BLM is currently in the process of deciding on the appropriateness of renewing the Federal Grant and the duration of renewal. These decisions will be provided in a record of decision that will be issued in early January 2003.

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